

Investigation of the Elastic Scattering  
of  $\pi^-$ -Mesons With a Momentum of 6.8 Bev/c  
on Protons by Means of a Propane Bubble  
Chamber

82016  
8/056/60/036/02/17/061  
B006/B011

$\sigma_{el}(\theta'_\pi > 6^\circ) = 3.75^{+0.25}_{-0.55}$  mb, by taking into account a  $\mu^-$  admixture of  
(5+2)%, with a total  $\pi^-$  track length of  $1.15 \cdot 10^6$  cm.  $\theta'$  is the scattering  
angle in the center-of-mass system. The total  $\pi p$  interaction cross section  
was estimated as being (30+5) mb. The final part of the present paper  
offers an analysis of experimental results on the basis of the optical  
model, with the proton being regarded as a homogeneous, sharply bounded  
sphere with a radius  $R = 1.05 \cdot 10^{-13}$  cm. The nucleonic absorption coefficient  
 $K$  is assumed to be  $K = 0.71 \cdot 10^{13}$  cm $^{-1}$ . Results are compared with those  
yielded by experiments (Table, Figs. 7,8). The authors finally thank  
Academician V. I. Veksler and I. V. Chuvilo for their discussions,  
N. A. Smirnov, Ye. K. Kuryatnikov, Yu. I. Makarov, M. A. Samarin,  
L. Ya. Ivanova, and K. N. Radina for their assistance. There are 8 figures,  
1 table, and 8 references: 2 Soviet and 6 American.

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ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy  
(Joint Institute of Nuclear Research)

LT

SUBMITTED: August 28, 1959

Card 4/4

VAN QAN-CHAN [Wang Kang-ch'ang]; VAN TSU-TSZEN [Wang TS'u-Tseng];  
DIN DA-TSAO [Ting Ta-ts'ao]; IVANOV, V.G.; KLADNITSKAYA, Ye.N.;  
KUZNETSOV, A.A.; NGUYEN DIN-TY; NIKITIN, A.V.; OTVINOVSKIY, S.Z.;  
SOLOV'YEV, M.I.

Creation of antiprotons in the interaction of  $\pi^-$ -mesons with  
nucleons. Zhur.eksp.i teor.fiz 38 no.3:1010-1011 (MIRA 13:7)

1. O<sup>byedinenny</sup> institut yadernykh issledovaniy. <sup>1969</sup>  
(Protons) (Mesons) (Nucleons)

83755

8/056/60/038/004/048/048  
8006/8056

24.6900

## AUTHORS:

Van Gan-chan, Van Tau-tzen, Vekaler, V. I., Viryaov, H.M.,  
Vrana, I., Din Da-tsao, Kim Khi In, Kladnitskaya, Ye. K.,  
Kusnetsov, A. A., Mikha, A., Nguyen Din Ty, Nikitin, A. V.,  
Solov'yev, M. I.

## TITLE:

Production of a  $\Xi^-$ -Hyperon<sup>19</sup> by Negative  $\pi^-$ -Mesons With a  
 Momentum of 8.3 Bev/c

## PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
 Vol. 38, No. 4, pp. 1356 - 1359

TEXT: In the present "Letter to the Editor", the authors give a detailed report on the case of a  $\Xi^-$ -production and decay discovered by them for the first time among 40,000 bubble-chamber photographs. The chamber happened to be in a 13,700-oe magnetic field. The photograph concerned is represented as well as the track scheme. The tracks are numbered, and the individual stars are denoted as "point A, B, O, ..". The exact data of the tracks and stars, respectively, are given in tables (Table 1: "Kinematics at point A"; Table 2: "Kinematics at point B"; Table 3: ✓

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Production of a  $\bar{\Sigma}^-$ -Hyperon by Negative  
 $\pi^-$ -Mesons With a Momentum of 8.3 Bev/c

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 B006/B056

"Kinematics at point O"; and Table 4: "Kinematics at points O' and O''"). The individual tracks are identified, and the charges and momenta (measured and calculated) of the particles, the kinetic and mass energies, and the total energy are given. For the stars B and O also the energy balance is given. For B, the following is considered to be the most

probable reaction:  $\bar{n} + C \rightarrow He_2^4 + 4p + 3n + \pi^+ + \pi^- + n\pi^0$ . For the primary star (Tables 3 and 4) the following reaction is assumed:

$\pi^- + C \rightarrow \bar{\Sigma}^- + K^0 + \bar{K}^0 + K^- + p + \pi^+ + \pi^- + \text{recoil nucleus}$ . The lifetime of the  $\bar{\Sigma}^-$ -hyperon was calculated to be  $(1.18 \pm 0.07) \cdot 10^{-10}$  sec. G.A. Blinov and S. Z. Otvinovskiy are mentioned. There are 2 figures, 4 tables, and 4 references: 3 Soviet and 1 US.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: March 24, 1960

Card 2/2



DIN DA-TSAO (Ting Ts -ts'ao), KIASHITSKAYA, Ye.N.

$\Sigma^-$  hyperon, a new antiparticle. Priroda 49 no.8:17-18 Ag '60.  
(MIRA 13:8)

1. Ob'yedinenyy institut yadernykh issledovaniy, Dubna.  
(Hyperons)

VEKSLER, V.I.; VRANA, I.; KLADNITSKAYA, Ye.M.; KUZNETSOV, A.A.; MIHUL, A.K.;  
MIHUL, Ye.K.; NGUYEN DINH TU; PEHEV, V.N.; SOLOV'YEV, M.I.; HOPMOKI, T.;  
CHEN-LING-YEN.

On strange particle production in  $\pi^+ p$  interaction. Dubna,  
Izdatel'skii otdel Ob'edinennogo in-ta yadernykh issledovaniy, 1961.  
9 p.

(No subject heading)

BIRGER, N.O.; WANG KANG-CH'ANG; WANG TS'U-TS'ENG; TING TA-TS'AO; KATYSHEV,  
Yu.V.; KLADNITSKAYA, Ye.N.; KOFILOVA, D.K.; LYUBIMOV, V.B.; NGUEN  
DIN TY; NIKITIN, A.V.; PODGORETSKIY, M.I.; SOLOV'YEV, M.I.

[Inelastic interaction of 6,8 Bev/s  $J/\psi^-$ -mesons and nucleons]  
Neuprugie vzaimodeistviya  $J/\psi^-$ -mезонов s impul'som 6,8 Bev/s s  
neuklonami . Dubna, Ob'edinennyi in-t iadernyykh issl., 1961. 30 p.  
(MIRA 14:11)

(Mesons)

(Nucleons)

C/026/61/017/005/001/006  
F050/F004

**AUTHOR:** Wang, Kang-ch'ang (3769/3227/2490); Wang, Chu-hsiang (3769/4376/5046); Viryasov, N. M.; Ting, Ta-chao (0002/1129/6856); Kim, Hi-in (6855/5593/0088); Kladnitskaya, Ye. N.; Kuznetsov, A. A.; Mikhul, A.; Nguyen, Din-ti (7086/0002/6337); Nikitin, A. V.; and Solov'yev, M. L.

**TITLE:** Production of  $\Xi^-$  hyperons by the use of  $\pi^-$  mesons with a momentum of 7000 Mev/c and 8000 Mev/c

**PERIODICAL:** Wu Li Hsueh Pao, v. 17, no. 5, 1961, 205-213

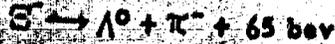
**TEXT:** The productive cross section  $\sigma$  ( $\sigma = 3.6 \pm 2.5 \mu\text{b}/N$  at 6800 Mev/c,  $\sigma = 10.6 \pm 4.4 - 3.2 \mu\text{b}/N$  at 8000 Mev/c), mass  $M_{\Xi^-}$  ( $M_{\Xi^-} = 1317.0 \pm 2.2$  Mev), and lifetime  $\tau_0$  ( $\tau_0 = 3.5 \pm 1.2 \times 10^{-10}$  sec) of  $\Xi^-$  hyperon were determined by the use of  $\pi^-$  mesons having momentums of 6800 Mev/c and 8000 Mev/c. In early investigations  $\Xi^-$  hyperons

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Production of  $\Xi^-$  hyperons by ...C/026/61/017/005/001/006  
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were found by experiments with cosmic rays. A butane bubble chamber 24 liters in volume in a permanent magnetic field of 13700 gauss was used. The chamber was irradiated by a bundle of mesons with momentums of 7000 Mev/c and 8000 Mev/c. The result was 27,000 and 75,000 tracks (obtained recording momentums of 6500 + 600 Mev/c and 8000 Mev/c of  $\pi$  mesons). A three-dimensions amplifier and projector were used to trace the negatives twice and some negatives were traced three times. In the tracing process those events which could be classified with  $\Xi^-$  hyperon decay scheme  $A \rightarrow V^0 + B$ ,  $V^0 \rightarrow C + D$ , by appearance were selected. The following standards were applied in the determination of  $\Xi^-$  hyperons: (1)  $V^0$  must coincide with kinematics of the decay scheme  $\Lambda^0 \rightarrow p + \pi^-$ , (2) The refraction point must be within the  $\Lambda^0$  decay plane. The vertical momentum of  $\pi^-$  meson and proton p, which came from  $\Lambda^0$  decay relative to the projecting direction of  $\Lambda^0$ , must be in equilibrium. (3) The  $\Lambda^0$  decay particles should lie on the plane formed by particles A and B. (4) At the refraction point, the vertical momentum of particles  $\Lambda^0$  and B particle must be in equilibrium. (5) The events must satisfy kinematics of  $\Xi^-$  hyperon decay scheme

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Production of  $\Xi^-$  hyperons by ...C/026/61/017/005/001/006  
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Among all the events there were 11 events which satisfied all 5 standards. Three events coincided well with the kinematics of  $\Xi^-$  decay and have been classified with  $\Xi^-$  hyperon. Of all  $\Xi^-$  hyperons, one was obtained by the bundle of  $\pi^-$  mesons with 6800 Mev/c and then were obtained by the bundle of  $\pi^-$  mesons with 8000 Mev/c. The results of this experiment are listed in four tables: (1) Table 1 lists data of defined  $\Xi^-$ . All these data were average values which were obtained by using a microscope to measure two — four times independently. It also lists the decay energy Q and lifetime of all  $\Xi^-$  hyperons found in their own coordinate system. (2) Table 2 lists all data concerning the primary stars. These stars have been analyzed as the source of  $\Xi^-$  hyperons. (3) Table 3 lists the momentum  $p^*$  in a  $\pi^-$  N mass center system, vertical momentum  $p^{\perp}$ , and projecting angle  $\theta^*$  of  $\Xi^-$  hyperons (suppose  $\Xi^-$  hyperons were produced by the impact of  $\pi^-$  mesons to free nuclei). The average vertical momentum ( $p_{\Xi^-}^{\perp}$ ) of  $\Xi^-$  hyperon is equal to  $315 \pm 35$  Bev. This value is approximate to the vertical momentum of proton and  $\Lambda$  hyperon. This table also lists the characteristics of the following angles: (a)  $\theta_{\Lambda}^*$  is the projecting angle of  $\Lambda^0$  which is projected out from  $\Xi^-$  hyperon decay process under its equilibrium

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Production of  $\Xi^-$  hyperons by ...

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F050/F004

system. (b)  $\theta_p^*$  is the projecting angle of p which was projected out from the decay process in its equilibrium system. (c)  $\omega_{\Xi^- \Lambda^0}$  is the intersection angle between  $\Xi^-$  and  $\Lambda^0$  decay planes. In the distribution of  $\theta_p^*$  and  $\omega_{\Xi^- \Lambda^0}$ , no asymmetry was observed. (4) Table 4 lists the events which seems to be  $\Xi^-$ . Among these events, four were in the same plane and fourteen were in different planes. Most of these events in the same plane were induced by  $\pi^+ \pi^-$  mesons; the others in different plane events may have been induced by  $\pi^+$ ,  $\pi^-$  or  $K^-$  mesons. Thanks are extended to V. L.

(Wei Ke Shih  
Lai Erb), I. V. (Chi Wei Lo), L. P. (Chi Lo Wei Yeh Fu), N. L.  
(Pa Pu La Fe), K. V. (Chi Ho Lo Fu), and L. N. (Chu Lao Yeh Fu). There  
are 3 figures and 4 tables. The English-language references read as follows: C. Fran-  
zinetti and G. Morpurgo, Suppl. Nuovo Cim. 6 (1957), 565; W. B. Fowler et al. Nuovo  
Cim. 11 (1959), 428.

SUBMITTED: March 20, 1961

Card 4/4

S/056/61/040/002/012/047  
B102/B202

AUTHORS: Wang Kang-ch'ang, Wang Ts'u-tseng, Veksler, V. I., Vrana, I.,  
Ting Ta-ts'ao, Invanov, V. O., Kladnitskaya, Ye. N.,  
Kuznetsov, A. A., Nguyen Din Ty, Nikitin, A. V., Solov'yev,  
M. I., Ch'eng Ling-yen

TITLE: Production of  $\Lambda^0(\Sigma^0)$  hyperons and  $K^0$  mesons in  $\pi^-p$  interac-  
tions with a  $\pi^-$  meson momentum of  $6.8 \pm 0.6$  Bev/c

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40,  
no. 2, 1961, 464-474

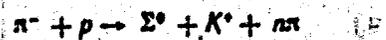
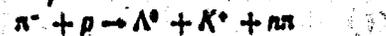
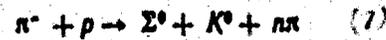
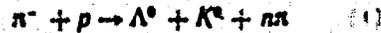
TEXT: The  $\Lambda^0(\Sigma^0)$  and  $K^0$  production in  $\pi^-p$  collisions has hitherto been  
studied only for threshold momenta of (0.9 - 1.4) Bev/c; to explain the  
nucleon structure and the interaction, studies must be made at higher ener-  
gies. The studies described were made with a 24-liter propane bubble cham-  
ber and a constant magnetic field of 13,700 oe. The experiment is described  
in Ref. 2 (ZhETF, 38, 426, 1960). The pictures were taken with a stereo-  
photocamera with "Russarplazmat" objectives (focal length 67 mm). The pic-  
tures were evaluated 2 or 3 times with stereo-magnifiers and reproducers.

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Production of ...

In this case, efficiency was 91 and 96%.  $\Lambda^0$  and  $K^0$  particles were selected according to rigorous rules. Altogether, 233 events conforming to these criteria were observed: space coordinates, angles, and momenta of these events were calculated by the electronic computer "Ural". The values obtained were geometrically corrected (consideration of the observation probabilities for  $\Lambda^0$  and  $K^0$  decays in the chamber volume as well as for  $\Lambda^0$  and  $K^0$  production). The number of events, in which 0, 2, 4, or 6 charged particles were observed besides  $K^0$  and/or  $\Lambda^0$  particles are given in Table 1. The mean number of charged particles accompanying a  $\Lambda^0$  or  $K^0$  production was  $2.5 \pm 0.1$ ; also  $K^{\pm}$  mesons were observed among these charged particles. The neutral particles recorded were produced in the reactions



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Production of ...

$\sigma(Y^0K^0) = \sigma(1) + \sigma(2)$ ,  $\sigma(Y^0K^+) = \sigma(3) + \sigma(4)$ , also the reactions

$\sigma(K^0\bar{K}^0) = \sigma(5)$ ,  $\sigma(K^0K^-) = \sigma(6)$ ,  $\sigma(\bar{K}^0K^+) = \sigma(7)$

$\sigma(Y^0K^{0,+}) = \sigma(Y^0K^0) + \sigma(Y^0K^+)$

$\sigma(K^0, \bar{K}) = \sigma(K^0\bar{K}^0) + \sigma(K^0K^-) + \sigma(\bar{K}^0K^+)$

$\pi^- + p \rightarrow \Sigma^+ + K^0 + n\pi$  (8,9)

$\pi^- + p \rightarrow \Xi^- + K^0 + K^+ + n\pi$  (10)

$\pi^- + p \rightarrow \Xi^0 + K^0 + K^0 + n\pi$  (11)

were possible. In the following, the reactions are referred to only by these figures; the cross sections are indicated by (I). The total cross section of  $\Lambda^0$  ( $\Sigma^0$ ) and  $K^0$  production on free protons was found to be  $2.0 \pm 0.35$  mb taking account of all corrections, including the  $\pi^-$  admixture and the efficiency of observation. In this case,

$\sigma(Y^0K^{0,+}) = 0.8 \pm 0.25$  mb,  $\sigma(K^0\bar{K}) = 1.2 \pm 0.3$  mb,  $R = \sigma(Y^0K^{0,+})/\sigma(K^0\bar{K})$

$= 0.7 \pm 0.2$ . Momentum and angular distributions are illustrated in several diagrams. The mean transverse momenta of  $\Lambda$  and  $K$  particles,  $388 \pm 35$  and  $393 \pm 35$  Mev/c, respectively, were equal within the limits of measurement errors.  $Y^0K^{0,+}$  and  $K^0\bar{K}$  pair production cross sections: The experimental results indicate that at  $\tau^-$  energies of 9 Bev, the  $K^0\bar{K}$  pair production cross section is higher than that of  $Y^0K^{0,+}$ . The ratio reads

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$$R = \frac{\sigma(Y^0K^0) + \sigma(Y^0K^+)}{\sigma(K^0K^0) + \sigma(K^0K^-) + \sigma(K^0K^+)} = 0.7 \pm 0.2.$$

The authors only studied  $K^0K^0$ ,  $K^0K^-$ , and  $\bar{K}^0K^+$ , and obtained

$$R = \frac{\sigma(Y^0K^0) + \sigma(Y^0K^+)}{\sigma(K^0K^0) + \sigma(K^0K^-) + \sigma(K^0K^+) + \sigma(K^+K^-)} = 0.5 \pm 0.15.$$

Near the production threshold (0.96 Bev),  $\sigma(Y^0K^0) = 1.1$  mb; it drops to 0.4 mb at 1.2 Bev, and increases again to 0.6 mb at 1.3 Bev. The ratio  $\sigma(Y^0K)/\sigma(K^0K)$  was experimentally determined to be 0.7; the theoretically obtained value (statistical theory) was 7.5. Mean multiplicity of charged particles: At 6.8 Bev, not only strange particles but also charged and uncharged particles were produced. In the case of multiple pion production, the mean number of charged particles was  $\bar{n}_s = 3.2 \pm 0.2$ , and in strange-particle production,  $\bar{n}_s = 2.5 \pm 0.1$ . Pions constitute the main part of charged particles. It can be concluded from the energy balance in a production event that the number of pions produced together with a strange particle is lower than in the case of ordinary multiple pion production. This is in

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Production of ...

agreement with the experimental results. The number of neutral pions accompanying strange-particle and normal multiple production is  $2.3 \pm 0.5 \pm 0.12$  was obtained for  $n_{\pi}$ . Angular and momentum distributions: The experimental results are illustrated in diagrams. In the center-of-mass system, the  $\Lambda^0$  hyperons show a strong tendency to depart in backward direction ( $n_{\text{forw.}}/n_{\text{backw.}} = 1.5$ ). This asymmetry was also observed in  $\Lambda^0 K^0$  pair-

production events. Table 4 gives numerical data concerning the angular distribution of  $\Lambda^0$  and  $K^0$  pairs in the c. m. s. Mesons produced together with  $\Lambda^0$  hyperons show a forward anisotropy at  $n_{\pi} = 2$  ( $n_{\text{forw.}}/n_{\text{backw.}} = 1.7 \pm 0.5$ ). At higher values of  $n_{\pi}$ , this anisotropy is less distinct. Transverse momenta: One of the most interesting results was that  $\Lambda^0$  hyperons and nucleons produced in inelastic collisions without strange-particle production had the same distribution and the same mean transverse momenta which are independent of multiplicity. The interaction radius in strange-particle production can be estimated from the root-mean-square transverse momenta. The authors obtained  $4 \cdot 10^{-14}$  cm. They thank D. I. Blokhintsev, M. A. Markov, V. I. Ogiyevetskiy, Chou Kuang-chao, I. V. Chuvilo, V. S. Barashenkov, V. O. Solov'yev for discussion, L. P. Zinov'yev, N. I. Pavlov, K. B. Chekhlov,

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Production of ...

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B102/B202

L. N. Belyayev for help in the experimental work, and T. Khofmaki' and Kim Khi Inu for assistance in the verification of the results. N. G. Birger and V. Belyakov are mentioned. There are 7 figures, 4 tables, and 9 references: 4 Soviet-bloc and 5 non-Soviet-bloc. The two references to English-language publications read as follows: Ref. 3: D. Glaser, Ann. Intern. Conf. on High Energy Physics at CERN, Geneva 1958; Ref 6: O. Maenchen, W. Fowler, W. Powell, R. Wright, Phys. Rev. 108, 850, 1957.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: September 1, 1960

Fig. 1: Momentum distributions of  $\Lambda^0$  hyperons in the c. m. s.; a) total spectrum, b) that of backward (solid line) and forward (dashed line) emitted  $\Lambda^0$  hyperons.

Fig. 2:  $\Lambda^0$  angular distribution in the c. m. s.; number of events given in parentheses.

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22124

S/056/61/040/003/004/031  
B102/B202

24.6900 (1134, 1191, 1559)

**AUTHORS:**

Wang Kang-ch'ang, Wang Ts'u-tseang, Viryasov, N.M., Ting  
Ta-ts'ao, Kim Khi In, Kladnitskaya, Ye.N., Kuznetsov, A.A.,  
Mikhul, A., Nguyen Din Ty, Nikitin, A.V., Solov'yev, M.I.

**TITLE:**

Production of  $\Xi^-$  hyperons by  $\pi^-$  mesons with the  
momenta 7 and 8 Bev/c

**PERIODICAL:**

Zhurnal eksperimental'noy i teoreticheskoy fiziki,  
v. 40, no. 3, 1961, 734 - 740

**TEXT:** The authors present comprehensive material concerning the produc-  
tion of  $\Xi^-$ -hyperons by negative high-energy pions in a 24-1 propane bubble  
chamber which was in a constant field of 13,700 oe. These experiments  
have already been described in an earlier paper (ZhETF, 38, 426, 1960).  
27,000 photographs were evaluated 2 - 3 times for pions with  $6.8 \pm 0.6$  Bev/c  
and 75,000 for pions with  $\approx 8$  Bev/c. The authors chose those events which  
corresponded to a decay of cascade particles according to the mode

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S/056/61/040/003/004/031  
B102/B202Production of  $\Xi^-$  hyperons by ...

$A \rightarrow V^0 + B$ ,  $V^0 \rightarrow C + D$  as well as all singly-pronged stars from the vertex of which a  $V^0$  particle departed. Altogether, 90 events were chosen; they were measured by means of UHM-21 (UIM-21) microscopes, and the results were evaluated by means of an electronic computer of the type "Ural"; 11 events of a  $\Xi^-$ -decay ( $\Xi^- \rightarrow p^0 + \pi^- + 65 \text{ Mev}$ ) were identified according to rigorous criteria. The angular and momentum characteristics of the identified  $\Xi^-$  hyperons are given in Table 1. The events nos. 171-218 and nos. 19-179 are schematically shown in Figs. 1 and 2, respectively. The Table gives the data concerning the decay energy  $Q$  and the lifetime (until the decay) of the  $\Xi^-$  hyperons. The mean value of  $Q$  from the 11  $\Xi^-$  decay events was  $Q = 61.9 \pm 2.2 \text{ Mev}$  from which the hyperon mass  $M_{\Xi^-} = 1317.0 \pm 2.2 \text{ Mev}$  was calculated. The mean lifetime was  $\tau_0 = (3.5^{+3.4}_{-1.2}) \cdot 10^{-10} \text{ sec}$ . The mean free path of the  $\pi^-$  mesons in  $\Xi^-$ -hyperon formation in propane was  $l = (2.02^{+2.86}_{-0.84}) \text{ cm}$  for a momentum of 6.8 Bev/c and  $l = (0.68^{+0.29}_{-0.20}) \text{ cm}$  for  $\sim 8 \text{ Bev/c}$ . Assuming that the  $\Xi^-$ -hyperon production cross section in nu-

Cont. 2/11-3

Production of  $\Xi^-$  hyperons by ...

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B102/B202

$\sigma_{\text{el}} \approx 1^{2/3}$ ,  $\sigma = 3.6^{+2.5}_{-2.1} \mu\text{b}$  is obtained with 6.8 BeV/c and  
 $\sigma = 10.6^{+4.4}_{-3.2} \mu\text{b}$  with  $\sim 8$  BeV/c. Table 2 gives data on the primary stars  
with  $\Xi^-$  hyperon production. Table 3 shows the momentum ( $p^*$ ), transverse  
momentum ( $p_1^*$ ), angle of departure ( $\theta^*$ ) of the various particles as well  
as the angle between the decay planes ( $\omega^0$ ). Table 4 presents data on  
the "background" events (4 coplanar and 4 noncoplanar ones) where  $V^0$  par-  
ticles were identified as  $\Lambda$  particles. Finally, the authors thank V.I.  
Veksler and I.V. Chuvilo for discussion, L.P. Zinov'yev, N.I. Pavlov,  
K.V. Chekhlov, L.N. Belyayev and various teams of technicians for their  
assistance. There are 3 figures, 4 tables, and 7 references: 5 Soviet-  
bloc and 2 non-Soviet-bloc.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy  
(Joint Institute of Nuclear Research)

SUBMITTED: September 30, 1960

Card 3/44 ?

BIRGER, M.O.; VAN QAN-CHAN [Wang Kang-ch'ang]; VAN TSU-TZEN [Wang TS'u-tseng];  
DIN DA-TSAO [Ting Ta-ta'ao]; KATYSHEV, Yu.V.; KLADNITSKAYA, Ye.N.;  
KOPYLOVA, D.K.; LYUBIMOV, V.B.; NGUYEN DIN TY; NIKITIN, A.V.;  
PODORETSKIY, M.I.; SMORODIN, Yu.A.; SOLOV'YEV, M.I.; TRKA, Z.

Inelastic interactions of 6.8 Bev./c  $\pi^-$ -mesons with nucleons.  
Zhur. eksp. i teor. fis. 41 no.5:1461-1474 N '61. (MIRA 14:12)

1. Ob'yedinennyy institut yadernykh issledovaniy.  
(Collisions (Nuclear physics))  
(Mesons) (Nucleons)

BELYAKOV, V.A.; VAN YUN-CHAN [Wang Yung-chang]; VIRYASOV, N.N.;  
DU YUAN'-TSAY [Du Yuan-cai]; KIM KHI IN; KLDNITSKAYA,  
Ye.N.; KUZNETSOV, A.A.; HOUYEN, DIN TY [Nguyen Dinh Tu];  
PEREV, V.N.; SOKOLOVA, Ye.S.; SOLOV'YEV, M.I.

[Properties of  $\pi^0$ -mesons produced together with strange  
particles in  $\pi^-p$  and  $\pi^-c$ -interactions] *Isuchenie  
svoistv  $\pi^0$ -mezonov, rozhdaemushchikhaia so strannymi cha-  
stitsami v  $\pi^-p$  i  $\pi^-c$  vzaimodeistviakh. Dubna, Ob'-  
edinennyi in-t iadernykh issledovani, 1962. 10 p.*

(MIRA 16:10)

(Mesons)

ARBUZOV, B.A.; KLADNITSKAYA, Ye.N.; PENEV, V.N.; FAUSTOV, R.N.

Elastic scattering of  $\Lambda$ -hyperons and  $K^0$ -mesons on hydrogen.  
Dubna, Ob"edinennyi in-t iadernykh issledovani, 1962. 11 p.  
(No subject heading)

VAN YU-CHAN [Wang Yung-ch'ang]; VEKSLER, V.I.; DU YUAN'-TSAY  
[Tu Yuan-ts'ai]; KLADNITSKAYA, Ye.N.; KUZNETSOV, A.A.;  
MIKHUL, A.; NGUYEN DIN TY; PEDEV, V.N.; SOKOLOVA, Ye.S.;  
SOLOV'YEV, M.I.; SARANTSEVA, V.R., tekhn. red.

[Generation of  $\Lambda K^0$  and  $K^0 K^0$  pairs in  $\pi^- p$  interactions at  $\pi^-$   
-meson energies of 7-8 Bev/c.] Issuchenie roshdenia  $\Lambda K^0$  i  $K^0 K^0$   
-par v  $\pi^- p$  - vzaikodeistviakh pri ispul'se  $\pi^-$ -mezona 7-8 Bev/c.  
Dubna, Ob'edinennyi in-t iadernykh issledovani, 1962. 15 p.  
(MIRA 15:6)

1. Institut Atomnoy fiziki, Bukharest, (for Mikhul).  
(Mesons) (Nuclear reactions)

*KLADNITSKAYA, S. N.*

ARBUZOV, B. A., KLADNITSKAYA, Ye. N., PEKRY, B. E. and FAIRBANKS, R. W. (6)

"Elastic Scattering of  $\Lambda$ -Hyperons and  $K_1^0$ -Mesons on Hydrogen"

report presented at the Intl. Conference on High Energy Physics, Geneva,  
4-11 July 1962

Joint Institute for Nuclear Research  
Laboratory of High Energies, Dubna, 1962

*KLADNITSKAYA, Ye. N.*

BELYANOV, V.A., MAO YUE-CHANG, YERKLER, V.I., VINYAZOV, N.M., WU HAN-TSUI,  
KIM HI IK, KLADNITSKAYA, Ye. N., KUZNETSOV, A.A., MISEL, A., PERIN, LIN TI, TENEV, V.N.,  
SOMKOVA, Is. S., GOROVITS, N. I.

"Study of  $\Lambda K$  and  $N K$  Pair Production in  $\pi^- p$  and  $\pi^+ p$  Interactions at the  
7-8 Gev/c Momentum of  $\pi$  Mesons"

report presented at the Intl. Conference on High Energy Physics, Geneva,  
4-11 July 1962

Joint Institute for Nuclear Research  
Laboratory of High Energy Physics

*KLADNITSKIYA, Ye. N.*

MELYAYEV, V.A., WANG YUNG-CHANG, VESELOV, V.Y., VINYAYEV, S.M., YASAA, I.,  
LU IHAN-TSAI, KIM HI IN, KLADNITSKIYA, Ye. N., KURBATOV, A.A., MIREL, A.,  
NGUYEN DINH TI, I. PATELA, Y. TENEV, BORKOVA, Ye. B., DALOVET, M.Y.,  
HOYDEL, T., and TSEN LIN-IAN

"The Investigation of  $\Lambda$ -Hyperon and  $\Lambda^0$ -Meson Production in  $\bar{u}O$  and  
Interactions at 7-8 Gev"

report presented at the Intl. Conference on High Energy Physics, Geneva,  
4-11 July 1962

Joint Institute for Nuclear Research  
Laboratory of High Energies

VEKSLER, V.I.; VIRYASOV, N.M.; VRANA, I.; KIM KH IN; KLADNITSKAYA,  
Ye.N.; KUZNETSOV, A.A.; NGUYEN DIN TY; SOLOV'YEV, H.I.;  
KHOPMOKL', T.; CHEN LIN-YAN'; SARANTSEVA, V.R., tekhn. red.

[Polarisation of  $\Lambda$ -hyperons produced in  $\pi^-$ -p-interac-  
tions at an energy of 7-8 Bev] *Issledeniye poliarizatsii  $\Lambda$ -  
giperonov pri roshdenii v  $\pi^-$ -p-vzaimodeistviyakh s ener-  
giiei 7-8 Bev. Dubna, Ob"edinennyi in-t iadernykh issl.,  
1962. 23 p. (MIRA 15:10)*  
(Hyperons--Decay) (Mesons--Decay) (Protons)

BELYAKOV, V.A.; VAN YUN-CHAN (Wang Yung ch'ang); VEKSLER, V.I.;  
VIRYASOV, N.M.; VRANA, I.; DU YUAN'-TSAY [Tu Yuan ts'ai];  
KIM KHI IN; KLADNITSKAYA, Ye.M.; KUZNETSOV, A.A.;  
MIKHUL, E.; NGUYEN, DIN TY; PATERA, I.; PENEV, V.N.;  
SOKOLOVA, Ye.S.; SOLOV'YEV, M.I.; KHOFMOKL', T.;  
MIKHUL, A.

[Production of  $\Lambda$ -hyperons and  $K^0$ -mesons in  $\pi^-p$ -  
interactions at an energy of 7-8 BeV] Issledovanie protses-  
sov rozhdenia  $\Lambda$ -giperonov i  $K^0$ -mезonov v  $\pi^-p$ -vzaimo-  
deistviakh pri energii 7-8 BeV. [n.p. n.d.] 26 p.

(Mesons) (Hyperons)

(MIRA 16:10)

S/056/62/042/004/009/057  
B108/B102

AUTHORS: Arbusov, B. A., Kladnitskaya, Ye. N., Penev, V. N.,  
Faustov, R. N.

TITLE: Elastic scattering of  $\Lambda$ -hyperons and  $K_1^0$ -mesons by hydrogen

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki,  
v. 42, no. 4, 1962, 979-984

TEXT:  $\Lambda$  and  $K_1^0$  particles were obtained from interactions of  $\pi^-$ -mesons with a momentum of 7-8 Bev/c with hydrogen and carbon in a propane bubble chamber placed in a constant magnetic field of 13,700 oe. 20  $\Lambda$ -p and 16  $K_1^0$ -p scattering events were selected from 70,000 photographs according to energy, momentum, and co-planarity criteria. The elastic scattering cross sections of  $\Lambda$ -p and  $K_1^0$ -p interaction averaged over the entire spectrum of momenta are  $(36 \pm 14)$  mb and  $(22 \pm 9)$  mb, respectively. The angular distribution of  $K_1^0$ -mesons in the c.m.s. has

Card 1/2

S/056/62/043/003/013/063  
B102/B104

AUTHORS:

Wang Yung-chang, Veksler, V. I., Tu Yüan-ts'ai,  
Kladnitskaya, Ye. N., Kuznetsov, A. A., Mikhul, A.,  
Nguyen Din Ty, Penev, V. N., Sokolova, Ye. S. Solov'yev, M. I.

TITLE:

Investigation of  $\Lambda K^0$  and  $K^0 \bar{K}^0$  pair production in  $\pi^- p$  inter-  
actions with  $\pi^-$  meson momentum of 7-8 Bev/c

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,  
no. 3(9), 1962, 815-822

TEXT: Pair production events, including 52  $(\Lambda + K^0)$ , 37  $(K^0 + \bar{K}^0)$ , 16 either  
 $(\Lambda + K^0)$  or  $(\bar{K}^0 + K^0)$  and two  $(\Lambda + K^0 + K^0)$  were observed among 60,000 photographs  
made with a 24-liter propane bubble chamber. The momenta and angular  
distributions of the  $\pi^+$ ,  $\Lambda$  and  $K^0$  particles were determined. Also the  
distribution of

$$Q = [2(E_{\Lambda(K)}E_K - P_{\Lambda(K)}P_K \cos \theta_{\Lambda(K), K}) + m_{\Lambda(K)}^2 + m_K^2]^{1/2} - m_{\Lambda(K)} - m_K (1)$$

(P - momenta)

Card 1/3

S/056/62/043/003/013/063  
B102/B104Investigation of  $\Lambda K^0$  and...

was studied and the results obtained were confronted with the theoretical curves (Monte Carlo method). Results: The mean  $K^0$  momentum from

$\Lambda K^0$  pairs was  $702 \pm 54$  Mev/c, from  $K^0 \bar{K}^0$  pairs  $604 \pm 55$  Mev/c. In the  $\pi^+ p$  c.m. ... in  $(55 \pm 9)\%$  of the events the  $\Lambda$  particles from  $\Lambda K^0$  pairs flow backward and those from the  $K^0$  forward. In  $(33 \pm 7)\%$  they both flow backward. In  $(12 \pm 4)\%$  they both flow forward or the  $\Lambda$  forward and the backward (this distribution indicates a contribution of peripheral interaction). The  $\Lambda$ -hyperon distribution has a peak at  $-1 < \cos \theta_{\Lambda} < -0.8$ .

For the  $K^0 \bar{K}^0$  pairs a maximum in the  $K^0$  distribution was observed at  $+0.6 < \cos \theta_{K^0} < +1$ . In  $(47 \pm 12)\%$  of the cases the both  $K^0$  mesons flow in opposite directions, in  $(25 \pm 7)\%$  both flow backward and in  $(28 \pm 8)\%$  both forward. From the angular distribution it can be concluded that in  $K^0 \bar{K}^0$  pair production besides the S-wave states with higher l will exist. The G-distribution for these pairs has a maximum in the range 50-150 Mev/c. There are 14 figures.

Ca

Card 2/3

BELYAKOV, V.A.; BOYADZHIYEV, A.V.; VAN YUN-CHAN (Wang Yung-ch'ang);  
VEKSLER, V.I.; VIRYASOV, N.M.; KIM KHI IN; KLADNITSKAYA,  
Ye.N.; KUZNETSOV, A.A.; MAL'TSEV, V.M.; NGUYEN, DIN TI;  
PENEV, V.N.; SOLOV'YEV, M.I.; ZRELOVA, N.N., tekhn. red.

[Production of  $\Lambda(\Sigma^0)$ -hyperons and  $K^0$ -mesons in the inter-  
action of 7 Gev.  $\pi^-$ -mesons with carbon] Rozhdenie  $\Lambda(\Sigma^0)$ -  
giperonov i  $K^0$ -mezonov pri vzaimodeistvii  $\pi^-$ -mezonov s  
energiei 7 Gev s uglerodom. Dubna, Ob'edinenyyi in-t iader-  
nykh issledovaniy, 1963. 18 p. (MIRA 17:2)

8/056/65/044/001/077/067  
 2108/2100

## AUTHORS:

Veksler, V. I., Vityasov, N. M., Vrana, I., Kim Shi In,  
 Kladnikaya, Ye. K., Kuznetsov, A. A., Nguyen Din Sy,  
 Solov'yev, M. I., Koshchik, T., Chen Ling-yen.

## TITLE:

The polarisation of  $\Lambda$ -hyperons produced in  $\pi^+p$ -interactions  
 at an energy of 7 - 8 Bev

## PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44,  
 no. 1, 1965, 84 - 99

TEXT: 60000 photographs were examined of the interaction of  $\pi^+$ -mesons of  
 7 - 8 Bev/c with protons in a 24-liter propane bubble chamber in a  
 permanent magnetic field of 15,700 gauss. Method and apparatus have already  
 been described (Wang Kang-ch'ang, M. I. Solov'yev, Yu. N. Shobin. PZH, 1,  
 41, 1959; M. I. Solov'yev, Proc. of the 1960 Ann. Int. Conf. on High  
 Energy Physics at Rochester, p. 388; Wang Kang-ch'ang et al. ZhETF, 39,  
 1854, 1960). The  $\Lambda$ -hyperons were unpolarized during their production.  
 This follows from the fact that there is no asymmetry in the angular dis-  
 tributions of the protons from the decay of the  $\Lambda$ -hyperons relative to  
 the hyperon momentum. The angular distributions of the  $\Lambda$ -hyperon produ-  
 Card 1/2

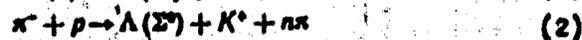
8  
S/056/63/044/002/007/065  
B102/B186

**AUTHORS:** Belyakov, V. A., Wang Yung Ch'ang, Veksler, V. I.,  
Viryasov, N. M., Vrana, I., Tu Yüan-ts'ai, Kim Khi Ying,  
Kladnitskaya, Ye. N., Kuznetsov, A. A., Mikhul, E. Nguyen  
Din Ty, Patsera, I., Penev, V. N., Sokolova, Ye. S.,  
Solov'yev, M. I., Khofmaki', T., Cheng Ling-yen, Mikhul, A.

**TITLE:** Investigation of  $\Lambda$ -hyperon and  $K^0$ -meson production  
processes in  $\pi p$  interactions at 7-8 Bev

**PERIODICAL:** Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44,  
no. 2, 1963, 431-443

**TEXT:** The c.m.s. momentum and angular distributions determined for the  
 $\Lambda$  and  $K^0$  particles produced in  $\pi p$  interactions are given and discussed.  
The measurements were made using a 24-liter propane bubble chamber in a  
field of 13,700 gauss. The total momentum spectrum of the  $\Lambda$ -hyperons  
produced in the reactions



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Investigation of  $\Lambda$ -hyperon ...S/056/63/044/002/007/065  
B102/B106

are shown in Fig. 1, compared with theoretical results. As it may be seen the statistical theory describes the experimental curve very well if the isobars and, the cases with  $p_p - p = \Delta < 700$  Mev are neglected.

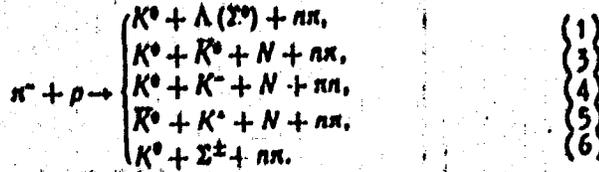
$\Delta < 700$  Mev corresponds to  $\sim 30\%$  of all  $\Lambda$ , these being produced in peripheral interactions. The  $\Lambda$  angular distribution has a distinct backward peak ( $\bar{n}_\Lambda / \bar{n}_\Lambda = 0.18 \pm 0.02$ ). With increasing multiplicity  $n_s$  the agreement between experiment and statistical theory improves. The  $\Lambda$  angular distribution and the distribution with respect to  $p_\perp$  is virtually independent of  $n_s$ . The overall mean of the transverse momentum is  $383 \pm 12$  Mev/c; for  $\Delta < 700$  Mev,  $\bar{p}_{\Lambda_\perp} = 295 \pm 14$  Mev/c and for  $\Delta > 700$  Mev,  $\bar{p}_{\Lambda_\perp} = 432 \pm 18$  Mev/c. For the  $K^0(\bar{K}^0)$  mesons produced in the reactions

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8/056/63/044/002/007/065  
B102/B186

8

Investigation of  $\Lambda$ -hyperon ...



the total momentum spectrum measured (Fig. 4) is weaker than that calculated according to the statistical theory. The angular distribution (Fig. 5) has, besides the isotropic part, a forward peak ( $\frac{\bar{n}_{K^0}}{\bar{n}_{K^0}} = 1.61 \pm 0.15$ ). The

forward-backward ratio decreases with increasing  $n_s$ . For the charged pions arising in  $\Lambda$ -production events the momentum distributions are, for  $p_x^* \geq 400$  Mev/c, well described by the statistical theory without taking the isobars into account; for  $p_x^* < 400$  Mev/c it is higher than that obtained from theory. The angular distributions for  $n_s = 2, 4, 6$  are characterized by

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Investigation of  $\Lambda$ -hyperon...8/056/63/044/002/007/065  
B102/B186

$$\bar{n}_{\pi^+}/\bar{n}_{\pi^-} = 1.10 \pm 0.12, \quad \bar{n}_{\pi^-}/\bar{n}_{\pi^+} = 1.40 \pm 0.13.$$

The mean number of  $\pi^0$  mesons produced per  $\pi^-p$  interaction with  $\Lambda$  production is  $1.23 \pm 0.14$ . The angular distribution of  $\pi^-$  arising in stars with  $K^0$  production has a flat forward maximum ( $\bar{n}_{\pi^-}/\bar{n}_{\pi^+} = 1.10 \pm 0.10$ ). The mean number of charged particles produced together with  $\Lambda$  is  $n_{\pm} = 2.22 \pm 0.13$  which agrees closely with the statistical theory without the isobars. The main part of  $\Lambda$  and  $K^0$  is produced in two-pronged stars. The admixture of  $K^0\Sigma^{\pm}$  pairs amounts to less than 20% of the number of  $K^0K^- + K^0K^+$  pairs. The momentum distribution of charged pions from  $\pi^-p$  interactions with  $\Lambda$ -hyperon production are characterized by  $\bar{p}_{\pi^+} = 425 \pm 16$  Mev/c and  $\bar{p}_{\pi^-} = 444 \pm 15$  Mev/c. From a comparison of these angular distributions it is concluded that processes involving  $\Lambda K$  or  $K\bar{K}$  pair production are more central than the usual processes of multiple pion production. If one divides the  $\pi^-p$  interactions with strange particle production into head-on

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Investigation of  $\Lambda$ -hyperon ...

8/056/63/044/002/007/065  
B102/B106

and peripheral collisions one can say that those involving  $K\bar{K}$  pair production are rather of the head-on type than those with  $\Lambda K$  pair production. There are 15 figures and 2 tables.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: July 31, 1962

Fig. 1. Total momentum spectrum of hyperons; dashed line: without correction for recording probability; shaded area: events with  $\Delta < 700$  Mev; curves obtained from statistical theory with (I) and without (II) isobars, and without the events with  $\Delta < 700$  Mev (II').

Fig. 4.  $K^0$  total momentum spectrum.

Fig. 5.  $K^0$  total angular distribution.

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1 3  
1 8  
2 8

L 10238-63

POS(r)/DIT(m)/EDS--AFFTO/ASD

ACCESSION NR: AP3000037

B/0056/63/044/005/1474/1480

69  
61

AUTHOR: Belyakov, V. A.; Wang Jung-ch'ang; Virasov, N. M.; Tu Yuan-te'ai;  
Kim Khi In; Kladnitskaya, Ye. N.; Kuznetsov, A. A.; Nguyen Din Ty; Penev, V. N.;  
Sokolova, Ye. S.; Solov'yev, N. I.

TITLE: A study of the properties of neutral pions produced with strange particles in negative pion proton and negative pion carbon interactions.

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 44, no. 5, 1963, 1474-1480

TOPIC TAGS: Neutral pions, strange particle interactions

ABSTRACT: An earlier investigation on the production of strange particles by 7-8 Bev negative pions on hydrogen and carbon was continued with a 24 - liter propane bubble chamber. The properties of the neutral pions inferred from the photons accompanying the LAMBDA hyperon and neutral kaon production are given and are compared with the properties of the pions (positive and negative) emitted in LAMBDA and neutral-kaon production processes. In calculating the total number of photons, corrections were introduced for the loss of photons

Card 1/2

L 10238-69

ACCESSION NR: AP3000037

8

emitted at large azimuthal angles and for the asymmetry of the incident beam relative to the longitudinal axis of the chamber. The possibility of a resonance with radiative decay is noted. "In conclusion, the authors wish to thank Academician V. I. Veksler, Professor Chang Weng-yu, M. I. Podgoretskiy, A. M. Baldin, A. V. Nikitin, V. B. Lyubimov and Yen Wu-kuang for useful discussions and many valuable remarks, the staff of the computation center for the calculations, and the laboratory assistants for the measurements. Orig. art. has: 4 figures, 9 formulas, and 4 tables.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: 07Dec62

DATE ACQ: 18Jun63

ENCL: 00

SUB CODE: PH

NR REF SOV: 006

OTHER: 004

*llm/ll*  
Card 2/2

L 15462-63

FCB(r)/EWT(m)/EDS AVTTC/ASD

8/0056/63/045/002/0088/0089 64  
63

ACCESSION NR: AP3005248

AUTHORS: Belyakov, Y. A.; Vekaler, Y. I.; Vityasov, M. M.; Vrana, I.; Kim Khi In;  
Kladnitskaya, Ye. N.; Kuznetsov, A. A.; Mikhail, A.; Nguyen Din Tr.; Solov'yev,  
M. I.; Hofborkl, T.; Ch'eng Ling-yen

TITLE: Antilambda hyperon production by 7-8 GeV negative pions on hydrogen

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 88-89

TOPIC TAGS: hyperon production, antilambda, negative pion decay, cross section

ABSTRACT: The production and decay of  $\bar{\Lambda}$  hyperons by 7-8 BeV negative pions are reported, on the basis of 42  $\nu^0$  events in which the momentum of the negative particle from the decay was greater than the momentum of the positive particle and the transverse momentum of the decay products was less than or equal to 100 MeV. Selection of the  $\bar{\Lambda}$  hyperons was by kinematic criteria, measurement of ionization, and determination of the  $\delta$ -electron energy. The cross section for the production of  $\bar{\Lambda}$  hyperons is found not to differ much from the cross section of NN production, or about 3  $\mu$ b. Orig. art. has 1 figure and 1 table.

Card 2/2

L 15462-63

ACCESSION NR: AP3005248

ASSOCIATION: Ob'yedinennyy institut yadernykh reaktsiy (Joint Institute of Nuclear Research)

SUBMITTED: 13Mar63

DATE ACQ: 06Sep63

ENCL: 00

SUB CODE: PH

NO REF BOV: 003

OTHER: 002

Card 2/2

BELYKOV, V.A.; VAN YUN-CHAN (Wang Yung-ch'ang); VEKSLER, V.I.; VIRIASOV, N.M.;  
DU YUAN'-TSAY (Tu Yuan-ts'ai); KIM KHI IN; KLADNITSKAYA, Ye.N.;  
KUZNETSOV, A.A.; NGUYEN DIN TY; PENEV, V.N.; SOLOV'YEV, N.I.

Polarization of  $\sqrt{\pi}$ -hyperons produced in  $\sqrt{\pi}$ -C-interactions at 7 Bev.  
Zhur. eksp. i teor. fiz. 45 no.2:90-92 Ag '63. (MIRA 16:9)

1. Ob'yedinennyy institut yadernykh issledovaniy.  
(Nuclear reactions) (Hyperons)

VAN YU-CHAN [Wang Yung-oh'ang]; KIM KHI IN; Kladnitskaya, Ye.N.;  
Kopylov, G.I.; Kuznetsov, A.A.; Mel'nikova, N.N.; Nguyen  
Din Ty; Sokolova, Ye.S.

[Search of radiative decays of resonances involving  $\Lambda$ -  
hyperons] Poiski radiatsionnykh raspadov rezonansov s  
uchastiem  $\Lambda$ -giperonov. Dubna, Ob'edinennyi in-t iader-  
nykh issledovani, 1964. 7 p. (MIRA 17:4)

BELIAKOV, V.A.; BOYADZHIYEV, A.V.; VAN YUN-CHAN; VEKSLER, V.I.; VIRYASOV,  
N.M.; KHIM KHI IN; KLADNITSKAYA, Ye.N.; KUZNETSOV, A.A.;  
MAL'TSEV, V.M.; NGUYEN DIN TY; PENEV, V.N.; SOLOV'YEV, M.I.

Production of  $\Lambda$  ( $\Sigma^0$ )-hyperons and  $K^0$ -mesons in interactions  
between 7 Gev.  $\pi$ -mesons and carbon. Zhur. eksp. i teor. fis.  
46 no.5:1586-1597 My '64. (MIRA 17:6)

1. Ob'yedinennyy institut yadernykh issledovaniy.

ACCESSION NR: AP4042554

S/0056/64/046/006/1967/1978

AUTHORS: Balyakov, V. A.; Veksler, V. I.; Viryasov, N. M.; Kladnit-  
skaya, Ye. N.; Kopylov, G. I.; Penev, V. N.; Sokolova, Ye. S.;  
Solov'yev, M. I.

TITLE: Pion resonances produced simultaneously with strange particles  
in negative pion proton interactions at 7.5 GeV/c

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 6, 1964, 1967-1978

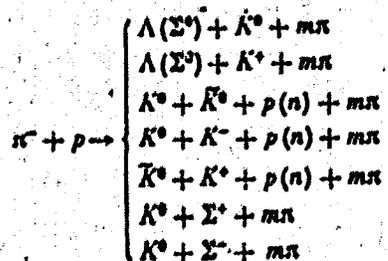
TOPIC TAGS: pion, negative pi meson, strange particle, resonance  
scattering, omega meson, proton reaction

ABSTRACT: Continuing a series of earlier research on the generation  
of strange particles and pions in a beam of 7.5 GeV/c negative pions  
(ZhETF v. 43, 815, 1962; v. 44, 431 and 1474, 1963; Proc. 1960  
Rochester Conf., 1961, p. 388), the authors investigated with the aid  
of 24-liter propane bubble chamber the pion resonances produced simul-

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ACCESSION NR: AP4042554

taneously with strange particles. Pion resonances produced in interactions of the type:



were investigated (m -- number of pions). Simultaneous production of  $\rho^0$  mesons and  $\Lambda K$  pairs was observed in events characterized by a charged particle multiplicity  $n_c = 4$  and having cross sections of  $20 \pm 8$  microbarns. Cross sections for the production of  $\omega$  and  $\eta$  resonances are presented. It is concluded that the four-pion effective

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ACCESSION NR: AP4042554

mass distribution has a peak at 1340 MeV and several possible reasons for this peak are suggested. "We are greatly indebted to M. I. Podgoretskii and I. V. Chuvilo for assistance and valuable discussion, to Tu Yuan-ts'ao, A. A. Kuznetsov, Kim Hi In, Nguyen Dinh Tu, and Wang Yung-ch'ang for participating in the first stage of the work, to N. N. Govorun and N. P. Markova of the computing center of OIYAI and to G. M. Korotkova, S. N. Komarova and L. M. Zhukova for measurements and calculations." Orig. art. has: 11 figures, 11 formulas, and 1 table.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research).

SUBMITTED: 30Dec63

DATE ACQ:

ENCL: 00

SUB CODE: NP

NR REF SOV: 009

OTHER: 012

Card 3/3

L 23730-66 ENT(M)/T

ACC NR: AP6014814

SOURCE CODE: UR/0367/65/001/002/0338/0350

AUTHOR: Belyakov, V. A.; Vekaler, V. I.; Viryasov, N. M.; Kladnitskaya, Ye. N.;  
Kladnitskaya, B. N.; Kopylov, G. I.; Penez, V. N.; Solov'ev, M. I. - Solovyev, M. I.

ORG: Joint Institute of Nuclear Research (Ob'yedinsmyy institut yadernykh issledovaniy)

TITLE: Baryon resonances in  $\pi$ -p interactions at 7.5 GEV with formation of strange particles

SOURCE: Yadernaya fizika, v. 1, no. 2, 1965, 338-350

TOPIC TAGS: baryon, meson, particle interaction, strange particle, hyperon, particle cross section

ABSTRACT: The formation and properties of resonances decaying into  $\Lambda$ -hyperons and  $\pi$ -mesons were studied. Data are given on the formation cross sections for  $Y^+(1385)$  and  $Y^+(1660)$ -hyperons in  $\pi$ -p interactions at 7.5 GEV/c. The properties and formation characteristics of  $Y^+(1385)$ -hyperons and their decay products were investigated. The maximum in the mass spectrum  $M_{\Lambda, \pi}^{Y^+}$  at the value 1770 MEV was discussed. The authors thank Professor M. I. Podgoretskiy and Professor I. V. Chuvpilo for their interest in the work and their discussions; A. Mikhail, Nugen Din Ty, A. A. Kuznetsov, Ye. S. Sokolova, Du Yuan'-tsay, Van Yun-ohan and Kim Khi In for taking part in the first stage of the work. Further thanks is rendered N. F. Markov and V. Ye. Komolov, co-workers at the Computer Center, for carrying out the calculations and the group

Card 1/2

L 23730-66

ACC NR: AP6014814

of laboratory workers for the measurements. The authors also thank V. O. Grishin, A. V. Nikitin, E. G. Bibeley, and I. Ruzalar for discussing the various problems of this work. Orig. art. has: 9 figures, 8 formulas, and 4 tables. [Based on authors' Eng. abst.] [SPRS]

SUB CODE: 20 / SUBM DATE: 01Sep64 // ORIG REF: 011 / OTH REF: 009

Cord 2/2/11

L 23731-66 ENT(m)/T

ACC NR: AP6014815

SOURCE CODE: UR/0367/65/001/002/0352/0365

AUTHOR: Belyakov, Y. A.; Vokaler, V. I.; Viryasov, M. M.; Klainitskaya, Ye. M.; Klainitskaya, E. M.; Kopylov, G. I.; Penev, V. N.; Bolov'yev, M. I.; Bolov'yev, M. I.

ORG: Joint Institute of Nuclear Research (Ob'yedinyemyy institut yadernykh issledovaniy)

TITLE: Meson resonances in pi-p interactions at 7.5 GeV with formation of strange particles

SOURCE: Yadernaya fizika, v. 1, no. 2, 1965, 351-365

TOPIC TAGS: pi meson, strange particles, particle interaction, K meson, mass spectrum

ABSTRACT: Resonances decaying into K\* (K\*, K+) and pi-mesons are investigated. Cross sections are given for the formation of K\* (888) and k (730) mesons in pi-p interactions at 7.5 GeV/c in events with KK pairs, and the contribution (in %) of K\*, K\*-mesons in events with pi K+ pairs is evaluated. Properties and formation characteristics of K\*+ mesons are described. Mass-spectra of the K2 pi and K3 pi systems are investigated. The possibility of the formation of a new resonance U - K\* + pi + pi + pi with mass 1660 MeV is indicated. An attempt is made to determine its quantum numbers. Proofs are given for the production of a resonance with mass 1050 MeV, decaying into three pi-mesons (pi+ pi+ pi-), which can be identified as the A1-meson.

Card 1/2

L 23731-66

ACC NR: AP6014815 FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722930007-1

The authors thank Professor M. I. Podgoritskiy and Professor I. V. Chuvpilo for interest in the work and for the discussions; A. Mikhail, Ngon Din Ty, A. A. Kusnetsov, Ye. S. Sokolova, Du Yuan'-tsay, Van Yun-ghan and Kim Kwi In for taking part in the first stage of the work. Further thanks is rendered to the co-workers at the Computer Center, N. P. Markov and V. Ye. Komolov, for carrying-out the calculations and the group of laboratory workers for the measurements. The authors also thank A. V. Nikitin, V. G. Grishin, E. G. Bubelev, and I. Kurelar for discussing the various problems of this work. Orig. art. has: 13 figures and 3 tables. [Based on authors' Eng. abst.] [JPRS]

SUB CODE: 20 / SUBM DATE: 018ep64 / ORIG REF: 008 / OTH REF: 013

Card 2/2

SKORMIN, A. (Tula); KLADNITSKIY, B. (Tula)

Six-terminal tube adapter. Radio no. 5:44 Ny '55.  
(Electron tubes) (MIRA 8:6)

*Kladnitskiy K.*  
AUTHOR: Kladnitskiy, R. and Skórmin, A., Tula 107-9-50/53  
TITLE: Manufacturing of Coil Cores (Izgotovleniye serdechnikov dlya katushek)  
PERIODICAL: Radio, 1957, # 9, p 63 (USSR)  
ABSTRACT: This article describes how defective cores and broken parts of carbonyl materials are powdered and utilized for manufacturing new cores. Figure 1 shows a pressing-device utilized for this purpose.  
The article contains 1 figure and 1 Russian reference.  
AVAILABLE: Library of Congress  
Card 1/1

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 8, p 104 (USSR) SOV/124-57-8-9291

AUTHORS: Ivanova, T. V., Kladnitskiy, V. M.

TITLE: A Graphic Method for the Calculation of Some Thick-walled Vessels  
(Graficheskiy sposob rascheta na prochnost' nekotorykh tolstosten-nykh sosudov)

PERIODICAL: Tr. Dal'nevost. politekhn. in-ta, 1955, Nr 44, pp 21-31

ABSTRACT: The authors explain a graphic method for the calculation of thick-walled vessels by employing the substitution of the variable as explained by R. Grammel' [see Bitseno, K. B., Grammel' R., Tekhnicheskaya dinamika (Technical Dynamics). Gostekhizdat, 1952, Vol 2, p 23]. The calculation is based on the approximate formulae for the stress in a thick-walled vessel, which had been obtained by the authors in a previous publication (Tr. Dal'nevost. politekhn. in-ta, 1949, Nr 37).

V. K. Prokopov

Card 1/1

IVANOVA, T.V.; KLADNITSKIY, V.M.; MARINENKO, N.S., red.

[Approximate calculation of beams resting on footings  
undergoing linear deformations in longitudinal-transverse  
flexure] O priblizhennom raschete balok, lezhashchikh na  
lineino-deformiruemom osnovanii pri prodol'no-poperechnom  
isgibe; metodicheskoe posobie. Vladivostok, Dal'nevostochny  
y politekhn. in-t, 1962. 4 p. (MIRA 17:4)

21.2100

77311  
SOV/57-30 2-8/18

**AUTHOR:** Kladnitskiy, V. S.

**TITLE:** Time-of-Flight Factor for a Linear Proton Accelerator

**PERIODICAL:** Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 2, pp 178-185 (USSR)

**ABSTRACT:** Panofsky (see reference) introduced the time-of-flight factor T which represents the ratio of the actual increase of particle energy to the ideal amount that the particle would acquire if it would cross the accelerating gap in a constant field, and if the field would not extend inside the drift tubes:

$$T = \frac{\int E_2(z) \cos \frac{2\pi z}{L_n}}{\int E_2(z) dz} \quad (1)$$

where  $E_2$  - the axial component of the electric field and  $L_n$  - length of the period of the accelerating system. Of importance is the quantity  $g_n/L_n$  which during the experiments described in this paper was

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Time-of-Flight Factor for a Linear  
Proton Accelerator

77311  
SOV/57-30-2-8/18

equal to 0.25. To compute T exactly one should know the exact shape of the field along the axis. Approximate computations yielded various approximate formulas containing supplementary multiplication factors taking care of special situations. Alvarez and others, and Cork (see references) developed such a factor for the case of drift tubes covered with klystron-type grids:

$$F = \frac{1}{2} \left[ 1 + \frac{I_0 \frac{2\pi r}{L_0}}{I_0 \frac{2\pi A_0}{L_0}} \right] \quad (4)$$

where  $I_0$  - Bessel function of the order zero of imaginary argument. There are no experimental data in the literature for T for this type of tube, and the author describes electrolytic tank measurements of the time-of-flight factor of the linear proton accelerator of the PTI AN USSR (PTI AS UkrSSR) in 1948. On the basis of these measurements, the factor T was calculated for systems with grids substantially different in construction from those at Berkeley. In electrolytic tank measurements one has the right to use the Laplace equation, if the region of interest is small compared to the wavelength  $\lambda$ . Resonator waves

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Time-of-Flight Factor for a Linear  
Proton Accelerator

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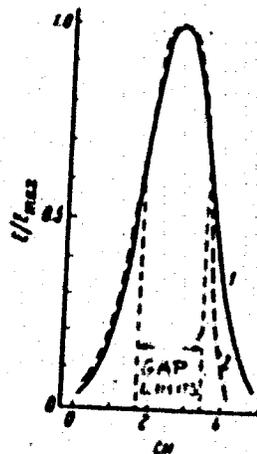
of the order of 1.5 to 2 m well-satisfied this requirement. Longitudinally cut sections of two drift tubes were placed in the tank in such a manner that the surface of the cut coincided with the surface of the electrolyte. Silver-coated copper was used in ordinary water serving as electrolyte. The author used tubes without grid with a 20-millimeter central opening and tubes with klystron-type grids with 20 and 35 mm apertures. The grids (screens) were made out of tungsten strips  $50 \mu$  thick and 2 mm wide. The potential measurements inside the gap were performed in the usual manner. The measurements of the field strength were made by means of two probes spaced 3 mm apart. A differential amplifier supplied then the signals to a cathode voltmeter A4-M2. The total experimental error was within +0.5%. Typical experimental curves are given on Fig. 6. In the case of the grid-covered tube the electrical and geometric centers of the gap do not coincide up to 16 cm length of the accelerating period. The author notes that one should not treat the grid as a nontransparent membrane for the field. This is seen also on graphs of Fig. 7.

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Time-of-Flight Factor for a Linear  
Proton Accelerator

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SOV/57-30-2-8/18

Fig. 6. Electrical field strength  
distribution along the axis of the  
accelerating system,  $L = 7$  cm.  
(1) for a symmetrical gap; (2) for  
a gap with a klystron-type grid.



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Time-of-Flight Factor for a Linear Proton Accelerator

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SOV/57-30-2-8/18

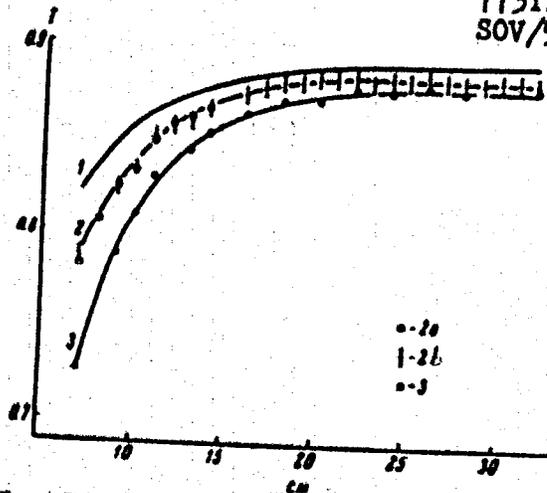


Fig. 7. Time-of-Flight factor for a linear proton accelerator. (1) for a gap with klystron-type grid, computed using Eq. (4); (2) for a gap with a klystron-type grid; (2a) from the field strength measurements; (2b) from potential measurements; (3) for a symmetrical gap from the field strength measurements.

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Time-of-Flight Factor for a Linear Proton Accelerator

77311  
SOV/57-30-2-8/18

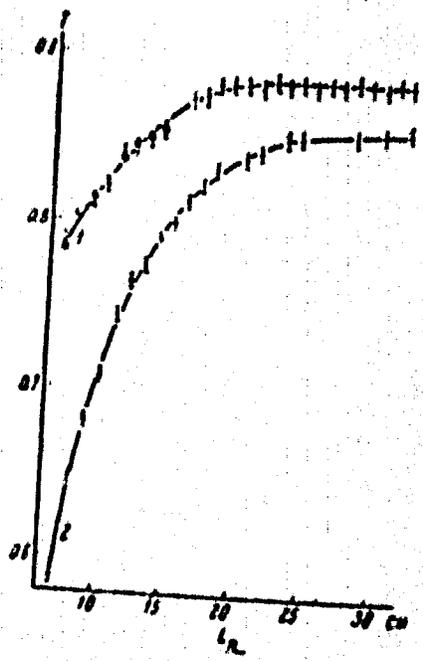
While the measured values on curve 3 agree with the theoretical computations, measurements in the grid-covered gap do not agree with computations using Eq. (4) which equation does not take into account the existence of the field inside the drift tubes. This inside field explains also the fast drop in T with decreasing  $L_n$ . Figure 8 shows the relationship between  $\tau$  and  $L_n$  for tubes of different apertures  $d$ . It is obvious that during computation one should use  $L_n/d \geq 4$ . A. B. Kuznetsov and N. B. Rubin discussed the results. There are 8 figures; and 6 references, 1 French, 1 U.K., 4 U.S. The U.K. and U.S. references are : L. Alvarez a. oth. Rev. Sci. Inst., 26, 111-133, 1955; B. Cork, Rev. Sci. Inst., 26, 210-219, 1955; D. Wilkins, AERE, GP/R, 1613, March, 1955; P. Einstein, Brit. J. Appl. Phys., 2, 49, 1951; W. Panofsky, UCRL, 1216, February, 1951.

Card 6/8

### Time-of-Flight Factor for a Linear Proton Accelerator

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SOV/57-30-2-8/18

Fig. 8. Relation between the time-of-flight factor and the aperture size of the drift tubes. (1) drift tube aperture 20 mm; (2) drift tube aperture 35 mm.



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Time-of-Flight Factor for a Linear  
Proton Accelerator

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SO"/57-30-2-8/18

ASSOCIATION: "nited Institute for Nuclear Research, Laboratory  
of High Energies (Ob"yedinennyy institut yadernykh  
issledovaniy, Laboratoriya vysokikh energiy)

SUBMITTED: October 3, 1959

Card 8/8

ACCESSION NR: AP4018366

S/0120/64/000/001/0061/0063

AUTHOR: Bogomolov, A.V.; Budagov, Yu. A.; Vasilenko, A.T.; Dzhelelov, V.P.;  
D'yakov, N.I.; Ivanov, V.G.; Kladnitskiy, V.S.; Lepilov, V.I.; Lomakin, Yu. F.;  
Moskalev, V.I.; Flyagin, V.B.; Shtet, T.I.; Shlyapnikov, P.V.

TITLE: Meter-long bubble chamber in a magnetic field

SOURCE: Priory\* i tekhnika eksperimenta, no. 1, 1964, 61-68

TOPIC TAGS: bubble chamber, meter long bubble chamber, 10 Gev particle  
chamber, bubble chamber in magnetic field, electromagnet bubble chamber

ABSTRACT: A bubble chamber with a sensitive volume of  $1 \times 0.5 \times 0.38$  m is  
described. The chamber is intended for studying the particle beams up to 10 Gev  
obtained from the OIYAI proton synchrotron. The chamber design was described  
earlier (Yu. A. Budagov, et al. International Conference on High-Energy  
Acceleration and Instrumentation, Berkeley, 1960); more details are supplied in  
the present article. Propane or some other liquid suitable for a particular  
experiment may serve as a working fluid. The chamber is placed in a 17-kilo-  
oersted magnetic field derived from a 2,200-kw electromagnet. The error in a

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ACCESSION NR: AP4018366

5-GeV/s-pulse measurement, evaluated from multiple scattering in propane, is  $\pm 3.2\%$ . In 1963, the chamber was installed at the output of the magnetic circuit of a  $\pi^-$ -meson beam whose energy lies between 4 and 7 GeV. "The authors consider it their duty to thank V. N. Sergiyenko, N. I. Frolov, K. A. Baycher, and the personnel of the experimental shop for their help in building the outfit. The authors are thankful to V. I. Veksler, N. I. Pavlov, and I. V. Chuvilo for their assistance in constructing the magnetic circuit of the  $\pi^-$ -meson beam. We are indebted to A. S. Strel'tsov, B. Ye. Critskov, B. V. Rozhdestvenskiy, and L. N. Fedulov for designing and building the magnet. The authors are deeply grateful to M. P. Moshkov, V. A. Lebedev, and S. P. Zudin who spent much effort and skill in all stages of constructing and aligning the outfit." Orig. art. has: 8 figures.

ASSOCIATION: Ob'yedinennyy Institut yadernykh issledovaniy (Joint Institute of Nuclear Studies)

SUBMITTED: 22Mar63

DATE ACQ: 18Mar64

ENCL: 00

SUB CODE: NS

NO REF SOV: 003

OTHER: 002

Card 2/2

KLADNITSKIY, V.S.

Flight time factor for a proton linear accelerator. Zhur.tekh.fiz.  
30 no.2:178-185 F '60. (MIRA 14:8)

1. Ob'yedinennyy institut yadernykh issledovaniy, Laboratoriya  
vysokikh energi.  
(Particle accelerators) (Protons)

L 47086-65 EIT(m) IJP(c)  
ACCESSION NR: AP5007018

S/0120/65/000/001/0024/0027

//  
7  
B  
109

AUTHOR: Kladnitskiy, V. S.; Flyagin, V. B.

TITLE: Shaping a pi-meson beam for a one-meter propane bubble chamber

SOURCE: Prilbory i tekhnika eksperimenta, no. 1, 1965, 24-27

TOPIC TAGS: bubble chamber, propane bubble chamber, pi meson

ABSTRACT: A magnetic channel is described which permits using the magnetic field of a proton-synchrotron for separating the negative pi-meson beam of 5 Gev. impulse and  $\pm 2\%$  spread. The channel permits: (a) extracting particles with different impulses along the same direction; (b) singling out a narrow interval of secondary-particle impulses; (c) efficient beam focusing in the center of the bubble chamber. The disposition of equipment is shown in Enclosure 1. Quadrupole magnetic lens  $Q_2$  yields a beam of parallel particles. lens  $Q_1$  focuses it at the 2-cm wide and 5-cm high collimator C. Magnet M eliminates dispersed

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ACCESSION NR: AP5007018

2

particles, and lens  $Q_2$  focuses the beam for the bubble chamber. Parameters of the equipment and characteristics of the pi-meson beam are given. "The authors wish to thank V. P. Dzhelepoz for his constant attention and valuable advice." Orig. art. has: 3 figures, 1 formula, and 2 tables.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Nuclear Research Institute)

SUBMITTED: 30Dec63

ENCL: 01

SUB CODE: NP

NO REF SOV: 002

OTHER: 000

Card 2/3

KLADIYENKO, D.P. (Chernovitsy, Ryzanskaya ul.,1)

Innervation of the thyroid gland in mammals. Arkh. anat. gist. i  
embr. 42 no.1:84-92 Ja '62. (MIRA 15:4)

1. Kafedra gistologii (nav. - dotsent I.A.Shevchuk) Chernovitakogo  
meditsinskogo instituta.  
(THYROID GLAND--INNERVATION)

30862. KLADO, N.

Sozvezdiya. (Serii sets. truda, rukovoditeli Kurgan-Tyubin. Rayona N. P. Paramonov, D. Dzhaliilov i I. M. Bashkin. Tadsh. SSR). Ocherk. Druzhba narodov, 1949, No. 4, s. 86-95.

KLADO, T. N.

## PHASE I Treasure Island Bibliographic Report

BOOK

Call No.: Q0961.K55

00000039

Author: KLADO, T.N.

Full Title: CLIMATE, ITS IMPORTANCE AND METHODS OF STUDY.

Transliterated Title: Klimat, ego znachenie i metody izucheniya

## Publishing Data

Originating Agency: None

Publishing House: Hydrometeorological Publishing House (GIMIZ)

Date: 1949

No. pp.: 87

No. copies: 10,000

## Editorial Staff

Editor: Sapozhnikova, S.A.

Technical Editor: None

Dr. of Geographical Sciences

Appraiser: None

Editor-in-Chief: None

## Text Data

Coverage: The book gives general information on: the climates of U.S.S.R; the methods and the system of collecting data; the climatic influence on life, agriculture and general economy; the organization of special expeditions. The importance of the knowledge of climate for aviation and the defense of the country is stressed. Mention is made of the automatic meteorological observations carried on in the arctic regions and their transmission by radio automatically to the Main Administration of the Hydrometeorological Service of the U.S.S.R.

Purpose: To make the general public acquainted with the importance of Meteorology and Climatology.

Facilities: None

KLADO, T.M.; RASKIN, I.M.

Immanuel Kant and the St. Petersburg Academy of Sciences; on  
archival materials of the Academy of Sciences of the U.S.S.R.  
Ist.-astron. issl. no.2:369-374 '56. (MLRA 10:6)  
(Kant, Immanuel, 1724-1804)

*KLADO, T.W.*

BEQUEREL', Antuan Anri [Bequerel, Antoine Henri]; KLADO, T.W. [translator].

Radiactivity - a new property of the matter; speech delivered by  
Henri Bequerel, in Stockholm, December 11, 1903. Trudy Inst. ist.  
est. 1 tekhn. 19:139-157 '57. (MIRA 11:2)

1. Onlen AN Frantsuzskogo instituta.  
(Bequerel, Antoine Henri, 1852-1908)  
(Radiactivity)

**SELEZNEVA, Yevgeniya Semenovna; TUDOROVSKAYA, Yelena Aleksandrovna;  
KLADO, T.N., otv.red.; SOLOVNYCHIK, A.A., tekhn.red.**

**[P.A.Molchanov; eminent Soviet aerologist] P.A.Molchanov  
vydaiushchiisia sovetskii aerolog. Leningrad, Gidrometeor.  
isd-vo, 1958. 101 p. (MIRA 12:2)  
(Molchanov, Pavel Aleksandrovich, 1893-1941)  
(Meteorology)**

**AUTHORS:** Klado, T. N., Kopelevich, Yu. Kh., 30-58-3-22/45  
Kuvanova, L. K., Romanov, N. S.

**TITLE:** Documents for the Biography of K. E. Tsiolkovskiy  
(Materialy k biografii K. E. Tsiolkovskogo)  
In the Archives of the AS USSR  
(V Arkhive AN SSSR)

**PERIODICAL:** Vestnik Akademii Nauk SSSR, 1958, Nr 3, pp. 94-103  
(USSR)

**ABSTRACT:** Many valuable documents for the biography of K. E. Tsiolkovskiy are preserved in the archives of the AS USSR. Already in 1899, he requested the then Academy for an expert opinion of his works in the field of aeronautics as well as for their moral and material assistance. Help and assistance, however, were granted only to a very small extent to him, since the importance of his works and experiments was not sufficiently appreciated at that time. In 1902, he furnished a substantial report on his experiments to the Academy, which was soon returned to him with various critical remarks by which he was disappointed. He interrupted further contacts with the

Card 1/2

Documents for the Biography of K. E. Tsiolkovskiy. In the  
Archives of the AS USSR

30-58-3-22/45

Academy. In 1950, the archives of AS USSR received further documents on Tsiolkovskiy comprising the years 1913 to 1935. Within that period he endeavored to propagate his ideas by means of periodicals and worked on problems in the field of astronautics. The AS USSR was charged to publish his works based upon documents comprising the years from 1878 to 1935. There are elaborate investigations and drawings of rockets and astronomical aircraft among these documents. Concluding, the authors state that Tsiolkovskiy was not granted to live to see the practical realization of his ideas; the then level of science and engineering did not allow this. There are 35 references, 35 of which are Soviet.

Card 2/2

KLADO, T.N.

Descriptions of observations of volcanoes on the moon in the 18th  
and the beginning of the 19th century. Ist.-astron. issl. no. 6:263-  
278 '60.

(Moon--Surface)

(MIRA 14:2)

BUTLEROV, Aleksandr Mikhaylovich [1828-1886]; ANGERT, G.A. [translator];  
MOOMA, M. [translator]; SOKOLOVSKIY, A.A. [translator]; VASIL'YEVA,  
S.N. [translator]; ALEKSEANDROV, L. [translator]; KLADO, T.N.  
[translator]; PLATE, A.F. [translator], red.; POODIN, S.A.,  
otv.red.; SYKOV, G.V., red.; RASKIN, N.M., red.; POLYAKOVA, T.V.,  
tekhn.red.

[A.M. Butlerov; his scientific and pedagogical endeavors. A collection  
of documents] A.M. Butlerov; nauchnaya i pedagogicheskaya deyatel'-  
nost'. Sbornik dokumentov. Moskva, 1961. 416 p.

(MIRA 14:3)

1. Akademiya nauk SSSR.

(Butlerov, Aleksandr Mikhailovich, 1828-1886)

ANDREYEVA, Yekaterina Vladimirovna; KLADO, Tat'yana Nikolayevna;  
BYSTORV, P.P., red.; VOLKOV, N.V., tekhn. red.

[Atmosphere and life] Atmosfera i shizn'. Leningrad, Gidro-  
meteoizdat, 1963. 265 p. (MIRA 16:7)  
(Meteorology)

EYLER, Leonard [Euler, Leonhard(1707-1783)]; KLADO, T.N.; KOPELEVICH,  
Yu.Kh.; LUKINA, T.A.; SMIRNOV, V.I., akademik, red.;  
SUBBOTIN, M.F., red.; RAYKOV, B.Ye., prof, red.;  
SUSHKOVA, T.I., red.isd-va; BOCHEVER, V.T., tekhn. red.

[Letters to scientists] Pis'ma k uchenym. Moskva, Izd-vo  
Akad. nauk SSSR, 1963. 395 p. (MIRA 16:6)

1. Chlen-korrespondent AN SSSR (for Subbotin).  
(Euler, Leonhard, 1707-1783)

KLADOV, G.K.; LYAKHOVITSKIY, Ye.M.; SHPIL'BERG, A.Ya.

Checking of arithmetic operations in a deduction code. Kiber-  
netika no. 4:43-44 JI-Ag '65. (MIRA 18:12)

1. Submitted Nov. 29, 1964.

KLADOV, G. H., inzh.

Combined laying of buried communication cables at the surface of  
the No. 2 "Mushketovskaia-Zapereval'naiia" Mine. Shakht. stroi. 8  
no. 8:25-26 Ag '64. (MIRA 17:9)

1. Donetskii Promstroy II proyekt.

GORODNICHEV, V.M., kand. tekhn. nauk; ANDREYEV, V.Ye.; KLADOV,  
G.M.; KUSEMET, V.G.; MELIKSETOV, S.S., retsenzent;  
NOVIKOV, N.I., retsenzent;

[Construction of buildings and other structures for coal  
mines] Stroitel'stvo zdaniy i sooruzheniy ugol'nykh  
shakht. Moskva, Nedra, 1964. 207 p. (MIRA 18:7)

KLADOV, Nikolay Dmitriyevich; VLASOV, Aleksey Vladimirovich; LEBEDEV,  
V.A., red.; TIKHONOVA, I.M., tekhn.red.

[Let's carry out the seven-year plan in five years; from the work  
practice of collective and state farms in Volosovo District]  
Semiletku v piat' let; iz opyta raboty kolkhosov i sovkhosov  
Volosovskogo raiona. Leningrad, Lenizdat, 1959. 92 p.  
(Volosovo District--Agriculture) (MIRA 13:7)

KLADOV, N.D.

Work practices of the Volosova peat processing enterprise serving  
collective and state farms. Zemledelie 8 no.12:62-68 D '60,  
(MIRA 13:11)

1. Pervyi sekretar' Volosovskogo rayonnogo komiteta kommunistiches-  
koy Partii Sovetskogo Soyusa, Leningradskoy oblasti.  
(Volosovo District--Peat)

OKL'TMAN, A.Z., insh.; KIADOV, N.I., insh.

The SM-569 equipment for removing and stocking ceramic blocks.  
Stroi. i doz. mashinestr. 5 no.10:29-30 0 '60. (MIRA 13:10)  
(Brick--Transportation)

KLADOV, S.G., elektrometrist

Device for locating underground metal pipes. Ger. Khos. Mosk.  
33 no.3:33-34 Nr '59. (MIRA 12:5)  
(Pipe)

S/121/60/000/012/013/015  
A004/A001AUTHOR: Kladova, K. I.

TITLE: The Life of Gear Shaper Cutters Made of New Steel Grades

PERIODICAL: Stanki i Instrument, 1960, No. 12, pp. 29-30

TEXT: The author presents the results of investigations carried out at the Moskovskiy instrumental'nyy zavod (Moscow Tool Plant) MIZ to test the life of gear shaper cutters made of the following new steel grades: P9K5 (R9K5), P9K10 (R9K10), P9F5 (R9F5), and P18F2M (R18F2M). These steels have been devised for heavy-duty cutting tools and were entered under the specification OCT (GOST) 9373-60. The R9K5 grade steel contains 5% cobalt and possesses a higher ductility, the R9K10 steel contains 10% cobalt and has a higher red hardness. The vanadium steel grades R9F5 and R18F2M contain 5% and 2% vanadium respectively. Compared with the R18 grade steel these new steel grades possess an increased red hardness and resistance to wear. The Plant manufactured a lot of shaper cutters, corresponding to the technological conditions of GOST 331-41, with the following parameters: module  $m = 2$  mm,  $\alpha_{\text{gear}} = 20^\circ$ ,  $d_{\text{index}} = 76$  mm. The temperature conditions of heat treatment of these cutters are cited in table 1.

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The Life of Gear Shaper Cutters Made of New Steel Grades S/121/60/000/012/013/015  
A004/A001

Table 1:

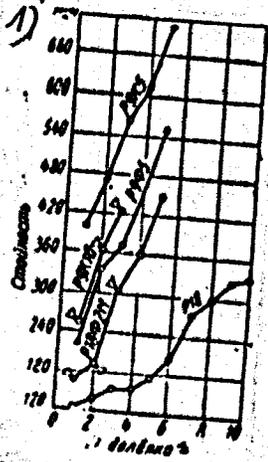
Steel Grade	Temperature Conditions t°			Rockwell Hardness
	Forging	Hardening	Tempering	
R9K5 (EI705)	Beginning 1160 Ending 900	1240	560 threefold	63 - 66
R9K10 (EI919)	-	1235	ditto	65 - 66
R9F5 (EM706)	Beginning 1160 Ending 900	1230 1240	"	63 - 65
R18F2M (EI917)	Beginning 1180 Ending 900	1260 1250	"	63 - 65

The author points out that the principal difficulty in the manufacture of the shaper cutters was presented by the grinding of the tooth profile, since particularly the R9F5 steel does not yield easily to grinding. Ten shaper cutters of each

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The Life of Gear Shaper Cutters Made of New Steel Grades S/121/60/000/012/013/015 A004/A001

steel grade were tested. The material being machined was 40X (40Kh) grade steel of HB 196-228 hardness. A total of 2,845 rims 15 mm wide was machined. The operations were carried out on the gear shaper of Messrs. Max Rober in the technological laboratory of the "Krasnyy proletariy" Plant under the following conditions: number of double strokes of the shaper cutter - 260 per minute, circular feed - 0.27 mm/double stroke, emulsion cooling. The cutting properties of the shaper cutters were investigated by determining the coefficient of comparative durability K from the wear curves:



where  $T_{test}$  - durability of the shaper cutters made of the steel grades being tested,  $T_{av 18}$  - average durability of shaper cutters made of the R18 grade steel. Figure 1 and Table 2 show the durability of shaper cutters made of different steel grades. Figure 2 shows the coefficients K for shaper cutters of different grades at a wear of 0.2 mm. Comparing the test results the author points out that the R0K5 grade steel is the most efficient for the manufacture of gear shaper cutters.

$$K = \frac{T_{test}}{T_{av 18}}$$

The Life of Gear Shaper Cutters Made of New Steel Grades S/121/60/000/012/013/015  
A004/A001

Figure 2:

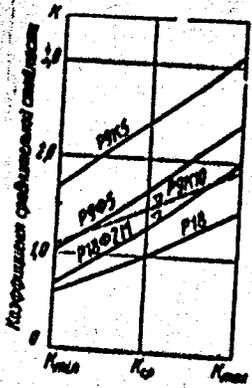


Table 2:

Durability in minutes	Steel Shaper Cutters				
	R18	R9K5	R9K10	R9F5	R18F2M
Minimum	130	400	250	235	170
Maximum	335	710	425	555	450
Average	225	550	345	390	300

Compared with the R18 grade steel it trebles the life of the shaper cutters, while cutters made of the R9F5 grade steel showed an increase in durability of 2.5 times. There are 2 figures and 2 tables.

Card 4/4

KLADOVIKOV

V.

MALINA, F.; inshener; KLADOVIKOV, V.

It would be better to explain the problems of using excavators  
("The single-shovel excavator operator." N.K.Aleksat. Reviewed  
by F. Malina, V. Kladovikov) Prof.-tekh.obr. 11 no.4:29-30 J1 '54.  
(MLRA 7:9)

1. Nachal'nik proizvodstvenno-tekhnicheskogo otdela Sverdlovskogo  
stroyupravleniya tresta "Uralsibekskavatsiya" (for Kladovikov)  
(Excavating machinery) (Aleksat, N.K.)

KLADOVSHCHIKOV, A T

PHASE I BOOK EXPLOITATION SOV/5676

Azarov, A. S., Candidate of Technical Sciences, Docent, ed.

Prisposobleniya dlya gruppovoy obrabotki detaley; opyt nekotorykh leningradskikh zavodov (Equipment for Group Machining of Machine Parts; Experience of Certain Leningrad Plants) [Leningrad] Lenizdat, 1960. 254 p. 3,000 copies printed.

Scientific Ed.: P. I. Bulovskiy, Doctor of Technical Sciences, Professor; Ed.: A. E. Lepin; Tech. Ed.: R. G. Pol'skaya.

**PURPOSE:** This collection of articles is intended for technical personnel and skilled workers in machine and instrument plants; it may also be used by students in schools of higher technical education and technicians.

**COVERAGE:** Basic principles in the design of universal, universal-setup, and group-machining jigs and fixtures are stated. This equipment is also considered from the standpoint of its application in several Leningrad machine and instrument plants.

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Equipment for Group Machining of (Cont.)

80V/5676

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Examples are given for the grouping of parts according to shape or special processing features. Constructions for group-machining fixtures are presented, and certain problems encountered in parts machining, fixture design, and cutting regimes are discussed. Calculations relating to the economic effectiveness of various types of jigs and fixtures are included in some of the articles. No personalities are mentioned. There are no references.

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Azarov, A. S. and S. T. Outkin. Fixtures for Group Machining Various Parts of Accessories

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AVAILABLE: Library of Congress (TJ1185.F69)

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VK/vro/jw  
11-15-61

TASHANOV, A. A. ALZHEIMER DISEASE, A.S.

Individual anasthetic (anesthetic) neurosurgical practice.  
Rep. no. 133-61 '65. (MIRA 18:10)

L. Klinika gosital'noy khirurgii (rav. - prof. V.P.  
Rozhnokovich) Vsesoyuznogo nauchnoissledovatel'skogo instituta.

**KLADOVSHCHIKOV, A.I. (Voronezh, Baturinskaya ul., d.15/14, kv.4);  
KHITROVA, A.D.**

Arterial infusion of blood in terminal states. Vest. khir. 70  
no.6:19-22 Je'63 (MIRA 16:12)

1. Is gospital'ney khirurgicheskoy kliniki (sav. - prof. V.P.  
Radushkevich) Voronezhskogo meditsinskogo instituta.